



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,730	10/19/2001	Michael Collins	00-682	4112

7590 01/28/2003

George A. Coury
BACHMAN & LaPOINTE, P.C.
Suite 1201
900 Chapel Street
New Haven, CT 06510-2802

EXAMINER

LIU, HAN L

ART UNIT	PAPER NUMBER
----------	--------------

3746

DATE MAILED: 01/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,730

Applicant(s)

COLLINS ET AL.

Examiner

Han Lieh Liu

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 – 3, 5 – 10, 16 – 19 – 28 and 30 – 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Kauffman et al. (USPN 5209076).

With regard to claims 1 – 3, 5 – 8, 17 – 19, 21, 23, 24 – 28 and 30 – 33, Kauffman et al. disclose an apparatus for monitoring a compressor, column 1 line 57 to column 2 line 58, comprising: a plurality of inputs, compressor suction temperature (40) and pressure (42), compressor discharge temperature (48) and pressure (46), oil pressure (44), monitor control device (38, detailed in Fig. 2), electrical control panel (52); control output to printer (56) and to compressor as indicated in Fig. 1; control device (38) with microprocessor (60) communicating with sensors (40, 42, 44, 46 and 48) through analog to digital converter (90), keyboard manual inputs, real time clock interface (76), alarm interface (92), memory interface (80) and reset interface (102); display module (64) for a remote computer screen, column 5 lines 29 – 34; analyzing and comparing inputs for control actions, column 5 line 3 to column 6 line 9.

With regard to claims 9 – 10 and 16, Kauffman et al. disclose the invention substantially as claimed in base claim. Furthermore, Kauffman et al. disclose the condition of “floodback” in column lines 24 – 28 and 43 – 54. The actual superheat is computed from the sensor

Art Unit: 3746

measurement and the compressor is automatically shut off and alarm signals are generated to indicate the presence of problem conditions, column 1 line 64 – column 2 line 6.

Claim 22 is rejected because of defected base claim 21.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4, 20, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kauffman et al. (USPN 5209076) and further in view of Allison et al. (USPN 5772403).

Kauffman et al. disclose the invention substantially as claimed in base claim 1. Kauffman et al., however, do not specifically disclose the commands for indicating that maintenance is needed. Allison et al. disclose that a control system, for monitoring operation of a pump including a microprocessor-based controller and a plurality of sensors, can accurately determine the next scheduled maintenance should occur, column 9 line 66 to column 10 line 5. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process to advantageously record each type of fault signals in the computer memory for determining the next scheduled maintenance as taught by Allison et al.

3. Claims 11 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kauffman et al. (USPN 5209076) and further in view of Pham et al. (USPN 6318101 B1).

Art Unit: 3746

Kauffman et al. disclose the invention substantially as claimed in base claim 1. Kauffman et al., however, do not specifically disclose a liquid slugging condition. Pham et al. teach that the liquid slugging condition is a function of discharge superheat, column 2 lines 11 – 18. Kauffman et al. monitor the compressor discharge temperature. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process with temperature sensors to monitor the compressor discharge temperature and to determine the discharge superheat for preventing liquid slugging condition as indicated by Pham et al.

4. Claims 13 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kauffman et al. (USPN 5209076) and further in view of Williams et al. (USPN 5946925).

Kauffman et al. disclose the invention substantially as claimed in base claim 1. Kauffman et al., however, do not specifically disclose a liquid injection valve on the compressor system. Williams et al. teach that using a liquid injection valve (36) in parallel to the solenoid valve (32) to avoid refrigerant condensate from accumulation in front of the valve and the cause of it is due to the pre-selected temperature threshold of the thermal process, column 5 lines 18 – 23 and 43 – 50 and Fig. 1. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process to advantageously include a liquid injection valve to be controlled by the microprocessor in concert with the temperature sensor, which monitors the compressor discharge temperature, for preventing the accumulation of refrigerant liquid in front of the solenoid valve.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Powell (USPN 5335507), Higdon (USPN 4788826), Andrews et al. (USPN 4227862), Richards (USPN 2871673).

Powell discloses a microprocessor-based air conditioning/refrigeration control system adapted for use with a variable speed compressor with sensors measuring the temperature and pressure of the refrigerant existing from the compressor. Superheat of the refrigerant is maintained at a first predetermined level while the compressor is operating at constant speed and is increased to a second, higher predetermined level while the compressor is accelerating. The system is able to diagnose deterioration of the compressor by measuring and comparing power input to the compressor and rate of change of temperature or pressure of the refrigerant at the compressor between initial and subsequent periods, and differentiate between deterioration of a drive component or a pressurizing component of the compressor.

Higdon discloses a method and apparatus for preventing flood back in refrigerant system, which includes a compressor, expansion valve and evaporator coil, by sensing the temperature differential across the evaporator coil and de-activating the compressor when the differential exceeds in the negative direction a pre-determined amount of superheat.

Andrew et al. disclose a solid system for controlling a compressor or pump, which is driven by a motor, the compressor being loaded or unloaded manually or automatically and proportionally to maintain a selected suction-pressure set point and to maintain the load. The control includes monitoring of temperatures and pressures associated with the system and automatic shutdown in response to malfunctions internal to the system.

Art Unit: 3746

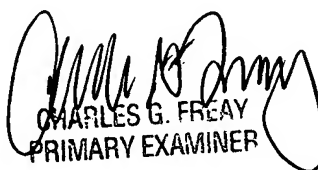
Richards et al. disclose a refrigerant system which incorporates apparatus for accumulating the slugs of liquid refrigerant returning in the suction line from the flooded evaporators and in utilizing the refrigerant gas from the high pressure side of the system for delivering the accumulated liquid back to the high pressure side where it is available for work.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Han Lieh Liu whose telephone number is 703-305-0860. The examiner can normally be reached on 7:30 to 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 703-308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0861.

Han Lieh Liu
January 20, 2003


CHARLES G. FREAY
PRIMARY EXAMINER